Dominion™-X

Unmanned autonomous mission management system

Elbit Systems™
C4I and Cyber

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The strategic expansion of unmanned platforms in multi-domain warfare highlights the need for enhanced integration and interoperability. This evolution demands sophisticated, intelligent technologies to enhance operational and combat effectiveness. Empowering combat units with a comprehensive solution for autonomous mission planning, execution, and management of multiple robotic and autonomous platforms is particularly relevant in distributed, large-scale autonomous systems, ensuring tactical edge superiority, freedom of maneuver, and mission success with the least possible risk to soldiers.

System Overview

Dominion-X is a battle-proven framework for autonomous systems operation that enables the planning, operation, and management of heterogeneous robotic platforms and payloads in multiple domains. The open and robust software stack enables autonomous UGV and UAS operation management capabilities, from single platform to swarm missions.

The management system recommends the optimal platforms and payloads and plots the route for each unmanned autonomous mission. The approved mission plan can be modified manually by the operator as needed. The system enables multi-asset collaboration featuring a range of services and functionalities and diverse payloads.

One to Many: One central control system for management, planning, and execution of single or multiple platforms and missions.

Configurable and customizable: The system enables users to easily create diverse operational plans.

Open architecture: Dominion-X features a multi-layered and scalable modular open architecture. The system supports multiple standards, including ROS/ROS2 (open robotics standardization), DDS, JAUS (ground robotics standardization), MAVLink, and more.

Integrated decision management capabilities: The modular and scalable AI-based decision management system (DMS) for dynamic, collaborative planning enables teamwork within distributed systems. The DMS facilitates complex task planning and allocation for effective synchronized mission execution and enables communication among team members.

Autonomous management system: Enables the operator to plan and execute tactical autonomous missions performed by unmanned robotic platforms and heterogeneous swarms. The system plans missions based on user inputs, including mission type (e.g., force protection, scan and discover, mapping, seek and strike, patrol), resources of platforms with payloads, time and duration (automatic overwatch, hot-swap planning), and location (mission area, takeoff and landing, no-flight zones). Advanced Edge AI and Edge DMS allow robotic platforms (UGV/UAV) to perform autonomous missions and collaborate with other swarm members.

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Key Benefits

- **Battle-proven:** In operational use worldwide
- **One to Many:** Complete solution for single/swarm platforms
- **Modular framework:** Multi-layered and scalable
- **Customizable:** User-defined missions and operational use cases
- **Standard protocols:** ROS/ROS2, JAUS
- **Platform agnostic**

Key Features

- Open architecture
- **Configurable:** Low code interface
- **DMS:** AI-based dynamic, collaborative mission planning
- Multiple **heterogeneous** tasks under one mission
- Autonomous and **remote airfield** management
- Obstacle avoidance algorithms based on EO and LiDAR
- Precise and safe landing algorithms
- Flight path planning and control

Operational Use Cases

- Autonomous UAS/UGV Missions
- HMT Tactical Maneuvering
- Seek and Strike Swarming
- HLS/Border Security
- Intelligence and Terrain Dominance
- C-UAS

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